2 PhD Positions at LNS at EPFL, Switzerland

The Laboratory of Nanostructures at Surfaces (LNS, http://lns.epfl.ch) headed by Prof. Harald Brune explores novel physical and chemical properties emerging from quantum effects in surface-supported nanostructures. One of the recent highlights of the laboratory has been the demonstration of single atom magnets, reaching the ultimate size limit of magnetic storage bits. Going beyond this achievement, and realizing magnetic quantum bits, requires a fundamental understanding of the magnetic relaxation mechanisms and identifying the optimum supporting substrate and magnetic quantum unit. We prepare our samples by in-situ physical vapor deposition of atoms and their self-assembly. They are characterized by scanning tunneling microscopy (STM) in our laboratory, and by X-ray absorption (XAS) and x-ray magnetic circular dichroism (XMCD) at synchrotron facilities.

We are seeking applicants for the following two projects:

**Giant magnetic anisotropy in uniaxial transition metal clusters**

Motivated by theoretical predictions of exceptionally high magnetic anisotropies in systems exhibiting perfect axial symmetry, we aim to realize this new class of quantum magnets through self-assembly of two types of transition metal atoms at surfaces. If theory is right, these quantum magnets exhibit stable magnetization up to 100 K or even beyond.

**Rare-earth-based quantum magnets supported on graphene**

We investigate rare-earth atoms, as well as dimers and trimers composed of rare earth and 3d transition metal atoms. They will be adsorbed on graphene grown on metal surfaces and ultra-thin insulating layers.

**Requirements**

Applicants should have an M.Sc. degree in Physics or equivalent, be highly motivated, and have experimental skills. Fluency in English, both written and spoken, is required.

The four-year positions, with a one-year probation period, are available starting from January 2018, the exact date being open to discussion.

**Application procedure**

Please send a motivation letter specifying your preferred project, an updated CV, transcript of records, as well as name and contact information of two references by e-mail to Stefano Rusponi (stefano.rusponi@epfl.ch) with subject line "Application for PhD student position at LNS".